

Special Initiative  
Report 20

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**Costs of Maternal  
Health Care Service  
in South Kwahu  
District, Ghana**

*October 1999*

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*Funded by:*  
U.S. Agency for International Development  
Office of Sustainable Development, Bureau for Africa





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**October 1999**

### **Recommended Citation**

Levin, Ann, Mark McEuen, Vito Tanzi, Gerry Van Dyck and Nino Sekyere-Boakye. 1999. *Costs of Maternal Health Care Service in South Kwahu District, Ghana*. Special Initiative Report No. 20. Bethesda, MD: Partnerships for Health Reform Project, Abt Associates Inc.

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**Contract No.:** HRN-C-00-95-00024

**Project No.:** 936-5974.13

**Submitted to:** USAID  
Office of Sustainable Development, Bureau for Africa

and: Robert Emrey, COTR  
Policy and Sector Reform Division  
Office of Health and Nutrition  
Center for Population, Health and Nutrition  
Bureau for Global Programs, Field Support and Research  
United States Agency for International Development



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# Abstract

This study by the Partnerships for Health Reform and Research International evaluates provider and consumer costs of five maternal health services, along with selected quality indicators, at four health facilities (one public and one mission hospital, one public and one mission health center) and among private midwives and traditional birth attendants in South Kwahu District of Ghana. The study examines costs of providing the services in order to examine the reasons behind cost differences, assess the efficiency of service delivery, and determine whether management improvements might achieve cost savings without lowering service quality. Costs that consumers pay to obtain maternal health services are also determined, along with the percentage of total costs recovered by providers from fees for services.

The study finds that routine maternal health services in the facilities cost less than \$6 for antenatal care and less than \$15 for vaginal delivery. Obstetrical complications are more costly, ranging from \$38 for treatment of postpartum hemorrhage at the mission hospital to \$93 for treatment of postpartum hemorrhage at the public hospital. Materials are the most costly input, comprising more than three-quarters of direct costs for all but one service.

The study finds that costs differ between hospitals and health centers as well as among mission and public facilities. Costs were higher at the mission health center than the public health center but were higher at the public hospital than the mission hospital. The differentials are explained through differences in service volume, use and availability of materials and equipment, number and level of personnel delivering services, and utilization levels of services.

The report concludes with several recommendations for cost savings and financing schemes, of particular importance to a country like Ghana, with its limited resources.

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# Acronyms

<b>ANC</b>	Antenatal Care
<b>GDP</b>	Gross Domestic Product
<b>GNP</b>	Gross National Product
<b>HIV</b>	Human Immunodeficiency Virus
<b>MOH</b>	Ministry of Health
<b>PHR</b>	Partnerships for Health Reform
<b>RI</b>	Research International
<b>TBA</b>	Traditional Birth Attendant

## Exchange Rate

At the time of this study, 2,400 Ghanaian Cedis = 1 U.S. dollar



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# Acknowledgments

This study is part of a three-part effort supported by the Office of Sustainable Development in the USAID Bureau for Africa and coordinated by Partnerships for Health Reform (PHR) to compare costs of maternal health services in Ghana, Malawi, and Uganda. The study was conducted in Ghana by Research International, Ltd. Discussions with the Ministry of Health, as well as with USAID and MotherCare Project representatives in Malawi, informed the focus and design of the study.

Implementation of the cost study in Ghana would not have been possible without the hard work and dedication of the study team's data collectors and observers. In addition, the authors would like to thank all the hospital and health center staff, traditional birth attendants, and clients who participated in and contributed to the study. They also acknowledge the assistance of Dr. Aaron Offei, regional medical director of Eastern Region, for his facilitation of the study.

The authors are grateful for the valuable comments of Professor Samuel Ofosu-Amaah. They would also like to thank Courtney Barnett and Leanne Dougherty for assistance with data cleaning and analysis.



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# Executive Summary

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## Introduction

This study evaluates provider and consumer costs, along with selected quality indicators, for five maternal health services provided at public and private hospitals and health centers, and by community practitioners in Ghana. The study also examines costs of providing the services in order to examine the reasons behind cost differences, assess the efficiency of service delivery, and determine whether management improvements might achieve cost savings without hurting quality. This assessment is important to Ghana and other African countries with ambitious goals for improving maternal health but scarce public health resources and limited government budgets.

The study also evaluates the costs that consumers pay to use the maternal health services, along with the contribution that revenues from fees for services make to recovering health facility costs.

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## Methodology

The Partnerships for Health Reform (PHR) project conducted this study in collaboration with the Research International (RI). The PHR–RI team collected data on the costs of delivering five maternal health services—antenatal care, normal deliveries, cesarean deliveries, post-abortion care, and postpartum hemorrhage complications—during 1998 at a public and a mission hospital, a public and a mission health center, and by 20 private midwives and 20 traditional birth attendants (TBAs) in South Kwahu District of Eastern Region of Ghana. The field team collected data during one week at each of the four health facilities and spent four other weeks collecting data from private midwives and TBAs.

The field team collected data on total operating costs (e.g., personnel, drugs, supplies, material, utilities, overhead expenses) directly associated with providing the maternal health services (direct costs), as well as related support costs (indirect costs). For a variety of reasons, the study does not include capital and investment costs. It does include several measures of structural quality and some measures of process aspects of quality. Data collection techniques included personnel observation studies to obtain data on time allocation of personnel, facility quality checklists, provider interviews to determine lines of treatments and time use, facility record reviews, and client exit interviews on expenditures and client satisfaction.

The Ministry of Health (MOH) and PHR–RI team jointly planned the field study and selected the study sites. The South Kwahu District was chosen because of the availability of public and mission facilities, accessibility, and the adequacy of service quality.<sup>1</sup> The rationale for these criteria was that there is little point in costing poor quality services.<sup>2</sup> Therefore, the data and conclusions from this analysis are best understood as case studies of four health facilities and of a small sample of independent community practitioners. The case study data can, however, be used to illustrate

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<sup>1</sup> A survey done by the MotherCare Safe Initiative Ghana team indicated that structural quality or availability of key drugs and equipment was adequate in the facilities in this district (MotherCare 1998).

<sup>2</sup> However, it should be noted that being well stocked is not equivalent to high quality.

financing and efficiency issues that the MOH could address in its efforts to strengthen maternal health services in South Kwahu District of Eastern Region and elsewhere in the country.

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## Provider Costs

Estimated total (direct plus indirect) operating costs of routine maternal health services in the four health facilities in South Kwahu District ranged from \$3.17 to \$4.03 in health centers and \$2.97 to \$5.45 in hospitals for antenatal care and from \$7.66 to \$9.74 in health centers and \$11.89 to \$14.60 for delivery services. Costs were higher for obstetrical complications, ranging from \$37.57 for treatment of postpartum hemorrhage at the mission hospital to \$92.94 for treatment of postpartum hemorrhage at the public hospital.

The unit cost analyses indicated that material (drugs and supplies) costs were high compared to other costs and comprised over three-quarters of direct costs for all but one service. The costs of labor, on the other hand, were relatively low due to low personnel salaries and staffing patterns.

Direct costs differed between hospitals and health centers. The direct costs of routine services were higher at the hospitals than at health centers (with the exception of antenatal care at the mission hospital), reflecting greater use of drugs and personnel. It should be noted that health centers are only equipped to provide basic treatment for routine services.

Differences in direct costs were found between the two public and the two mission facilities. The costs were higher at the mission health center than the public health center, because the mission center uses more materials. On the other hand, costs were higher at the public hospital than the mission hospital, due to greater use of materials and personnel at the former. This finding suggests that resources are more concentrated at the public hospital.

Indirect costs made up a significant portion—16-38 percent—of total costs. Indirect costs were related to the service volume at the facilities and were lowest at the mission hospital due to its relatively high service volume.

In general, the non-labor cost of services provided by private midwives was similar to those provided at the four facilities. More specifically, their cost was similar to the cost at health centers for antenatal care, and between the costs of the public and mission health centers for delivery services.

For routine services, the direct costs of traditional birth attendants were less than those of other providers. However, it should not be concluded that they are a cost-effective alternative to other providers, since they lacked key drugs and equipment and provided antenatal care only infrequently. Instead, they should be used when other options are not available.

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## Provider Efficiency

The study observed inefficient use of labor resources in some facilities. For example, in the public hospital, the number of midwives is higher than necessary, given the number of deliveries that took place. Overstaffing makes the services unnecessarily expensive.

Two approaches can be taken to alleviate the problem of overstaffing of maternal health personnel at the public hospital: (1) the number of staff can be decreased, through attrition, or re-assignment to other, busier wards, and (2) the service volume for maternal health can be increased. If the number of staff at the hospital is decreased, then the unit cost of labor for services will decrease.

Similarly, if the service volume is increased at the facility, then the indirect costs will be divided among more services, and, again, the unit costs will decrease.

The health centers, particularly the public health center, have low service utilization, especially for deliveries. If the service volume at these facilities were increased, particularly deliveries, then the unit costs could be reduced.

Another efficiency issue is the amount of time that health personnel spent on administrative activities. Assuming that more than 30 percent of time spent on administrative work is too much, then both the senior midwives and enrolled midwives in the public hospital and mission health center are spending too much time on administrative activities. If the process could be streamlined, then these employees could spend more time on service provision. However, it will also be important to increase the service volume at these facilities.

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## Provider Quality

In general, the findings regarding the indicators of service quality, measured by availability of key drugs and equipment and use of standard protocols, suggest that quality is at a reasonable level for all four facilities. One factor that probably affects structural quality indicators in public facilities is the “cash-and-carry” program for drugs, which increases the likelihood that drugs are available.<sup>3</sup> Although little variation on process indicators was found among the facilities, the mission hospital scored best in this regard; i.e., it was more likely to have prescribed drugs available, had shorter waiting times for services, and was the only facility to have curtains and screens for privacy).

Clients were more satisfied with the services provided at the public than at the mission hospital, possibly because of the lower user fees and smaller client volume. They were also more satisfied with services received at the mission health center than at the public health center.

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## Client Costs

Costs to the client were highest at the mission hospital, followed by those at the public hospital. They were substantially lower at health centers. Despite the higher costs, however, the mission hospital has the heaviest service volume of the four facilities, suggesting that clients are willing to pay for services if they think the service is of reasonable quality.

For antenatal care, client costs at health centers were one-fifth of those at hospitals. One strategy to promote the use of health centers for maternal health care would be to emphasize the advantage of lower costs<sup>4</sup> and shorter travel times.

User fees comprised over 50 percent of total client costs. Other costs to the client, including travel, made up less than 30 percent of their costs. Clients paid more travel costs to go to the mission hospital than the public hospital, perhaps because it was the referral hospital.

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<sup>3</sup> Despite the fact that key drugs and supplies were available in all of the facilities, though, 12-23 percent of clients suggested that more drugs should be available.

<sup>4</sup> However, if clients associate value with costs, then they may prefer to go to the hospitals.

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## Cost Recovery

Cost recovery was highest at the mission hospital, ranging from 20 percent to 211 percent. The rates were relatively similar for delivery and cesarean section services.

The rates at the public hospital are a half to a third of those for the mission hospital. However, since the service volume is low at both the public hospital and public health center, before considering an increase in the rates at the public facilities, the reasons for the low utilization should be determined. For example, it is possible that improvements to the services have been made but not publicized sufficiently to the target population; because people are not aware of the improvements, they are not using the services. In that case, it will be important to conduct a behavior-change communications campaign to inform consumers of the improvements.

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## Recommendations

- ▲ *To improve the allocation of resources, more use of routine maternal health care at lower levels of the health system should be encouraged.*

Since the unit cost of providing routine services is lower in health centers than in hospitals and their service quality is acceptable, clients should be encouraged to use these facilities for these services. Hospital resources can then be reserved for more complicated maternal health services that require more highly skilled, and therefore costly, hospital personnel. One means of increasing the use of health centers is through initiating home visiting (or increasing the visits if they are already taking place) by health personnel in the district.

- ▲ *To decrease unit costs at public facilities, the Ministry of Health should seek ways to reduce the number of maternal health staff at the public hospital and/or encourage increased utilization of maternal health services at public sector facilities.*

Since the number of maternal health staff at the public hospital is too high for the number of services that are provided, unit costs can be lowered by reducing the number of staff providing these services. A second way to reduce unit costs is to increase the utilization of public sector services; unit costs will decrease since indirect costs will be spread among more services.

Before encouraging increased utilization of public facilities, the perceptions of the population toward the services at these facilities should be assessed. If, for example, low utilization is due to lack of awareness about improvements in service delivery at these facilities, then a communications campaign should be conducted. If, on the other hand, utilization is low because clients perceive that user fees are too high for public institutions, making adjustments to or scaling the fee schedule should be considered.

- ▲ *Before increasing user fees, the public sector should assess the population's willingness and ability to pay for maternal health services.*

Since it is not clear whether user fees affected utilization when they were introduced in South Kwahu or whether they would be affected by a future increase in fees, the willingness and ability of clients to pay for maternal health services should be assessed, particularly since utilization is already too low.

- ▲ *One approach that could be considered when evaluating possible cost recovery options is the introduction of financing schemes such as insurance schemes for maternal health care based on actual costs so there can be risk-sharing among clients. The MOH might consider eventually including maternal health services as part of a broader package of services.*

Other studies (e.g. Asenso-Okyere 1997) have shown willingness to pay for health insurance in this district.

- ▲ *Managers should review the time that staff, particularly senior midwives and enrolled midwives, spend on administrative time.*

Since substantial amounts of time are being spent by both senior midwives and enrolled midwives on administrative activities, it is important that their activities be reviewed to determine whether they can be streamlined.

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## **Additional Research Questions**

To understand better why service utilization is low while client satisfaction is high at the public hospital, a survey should be undertaken to assess consumer attitudes and their perceptions of public facilities in South Kwahu.

- ▲ A more thorough assessment of service quality should take place.
- ▲ To have a fuller picture of drug use, assessments of whether drugs are under-, over- or misprescribed should take place.



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# 1. Introduction

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## 1.1 Overview

This study is part of a three-country effort supported by United States Agency for International Development (USAID) and coordinated by Partnerships for Health Reform (PHR) and Research International, Ltd. (RI) to compare costs of maternal health services in Ghana, Malawi, and Uganda. It aims to provide information to effect policy and program reforms towards optimal provision and utilization of maternal health services.

In order to contribute to the USAID Population, Health and Nutrition Center's strategic objective to reduce adverse health outcomes to women as a result of pregnancy, PHR has a Maternal and Reproductive Health Special Initiative to improve the management and sustainability of maternal and reproductive health programs. The three-country study came as part of a request from USAID/Bureau for Africa and is concurrent with a more qualitative assessment of Safe Motherhood interventions in Uganda, Malawi, and Ghana carried out by the USAID-sponsored MotherCare Project. This paper will focus on the results of the costing study PHR and RI conducted in one district of Ghana.

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## 1.2 Study Objectives

The main objective of the study is to estimate costs of key maternal health services and to compare differences among facility levels, including community providers, as well as between public and private (mission) providers in one district of Ghana. A second objective is to estimate the cost to consumers of attaining these maternal health services.



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## 2. Background

Ghana is located in western Africa and has a population of 18.5 million and a population growth rate of 2.7 percent. Almost half of the population (45 percent) is under 15 years of age. The majority of Ghanaians live in rural areas (63 percent), and the national literacy rate stands at 64 percent. Ghana's economy is mainly rural: cocoa, timber and pineapples are the main export crops; and mining (mainly gold) has become one of the biggest sources of foreign exchange. The emerging industrial sector's products include cassava, fruit juice, and cocoa by-products. Nevertheless, Ghana remains a poor country with a GNP per capita of only \$370.

Ghana is slowly recovering from the severe economic problems it faced in the 1970s and 1980s, when per capita income fell by a third and inflation was over 100 percent. In 1983, the government launched an aggressive program of stabilization and economic liberalization. It sought to reduce budget deficits and create a market-friendly environment. In the decade that followed, growth averaged 5 percent and the physical and social infrastructure was largely rehabilitated. Nevertheless, the country still faces severe economic challenges. For example, GDP growth for 1997 was 4.2 percent, not enough to have any significant impact on poverty considering a population growth rate of 2.7 percent.

While the health status of the population continues to improve, morbidity and mortality rates continue to be high. Life expectancy is 57 years, the infant mortality rate is 71/1,000 live births (1996) and the maternity mortality ratio is 740/100,000 for 1990-96 (World Bank 1998, 1999). The main health problems are malaria, tuberculosis, respiratory, and gastro-intestinal infections as well as nutritional deficiencies. However, non-communicable diseases, such as diabetes and cardiovascular diseases, are beginning to assume significance. In addition, there are wide variations between urban and rural populations, and among regions and different cultural and religious groups. Many adult women die from complications in pregnancy, childbirth, or unsafe abortions, and the rate of HIV is increasing rapidly.

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### 2.1 The Health System in Ghana

The health system is a tiered system with nine regional hospitals, 85 district hospitals, and a large number of subdistrict health centers. Although health sector expenditure has risen dramatically over the years, health services remain variable and inequities exist in the availability of facilities and quality of services provided between rural and urban areas (Asenso-Okyere 1997). The main problems are frequent shortages of drugs and medical supplies, long waiting times, and the absence of emergency and diagnostic services.

Although access to health facilities has increased, large portions of the population still do not have access to these basic services. New health issues, such as AIDS and chronic diseases, are also competing for attention. Rather than targeting the poor, government resources have been disproportionately spent on less cost-effective tertiary levels of curative care.

Many donors have been supporting the health sector in Ghana, though the previous lack of a health policy framework has impeded a comprehensive and coordinated health system. This lack of coordination has resulted in numerous vertical programs.

The government's health sector reform program, which is based on the Medium Term Health Strategy (MTHS) to achieve Vision 2020, aims at providing universal access to basic health services, improving the quality and the efficiency of health services provision, and fostering linkages with other sectors contributing to health. The main strategies include: (i) strengthening primary health services; (ii) improving the capacity for policy development and analysis, resource allocation, performance monitoring and evaluation, and regulation of service delivery and health professionals; (iii) strengthening national support systems for human resources, logistics and supplies, financial management, and health information; and (iv) promoting private sector involvement in the delivery of health services. The government has adopted a sector-wide approach to health that integrates government and donor efforts to achieve defined goals and includes joint systems to monitor sector performance.

The MOH has been decentralizing control over health administration to health workers in the districts, but has not involved elected representatives of communities in the local assemblies and the unit committees in the subdistricts in the oversight of health services in their communities.

Logistic support for drugs, medical supplies, maintenance, and equipment has only recently improved, after decades of neglect. Yet drug shortages are still common, medical equipment often does not work, personnel are not effectively deployed, and staff morale suffers.

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## **2.2 Financing Health Care in Ghana**

The most critical issue in the health sector in Ghana is the overall lack of resources. The health sector share of total public expenditure is only 1.3 percent of GNP. The proportion of government recurrent expenditures devoted to health was 8.4 percent in 1997, down from 11.1 percent in 1990, and high inflation diminished its purchasing power. The overall per capita public expenditure on health—equivalent to about US\$6 in 1997—is low even by sub-Saharan standards. This has a direct impact on the ability of the Ministry of Health to run an efficient and effective system. The lack of financial resources for non-wage recurrent costs causing shortages in drugs and medical supplies. The Health Sector Program, financed by the government, external aid, and private spending, aims at increasing public per capita expenditures to the equivalent of US\$9 in the medium term.

User fees were increased in Ghana in 1985 as a means of improving efficiency and the financial sustainability of the health care system. The 1985 Hospital Fees Regulation specified the fees to be charged for consultation, laboratory, and other diagnostic procedures; medical, surgical, and dental services; medical examinations; and hospital accommodation. It also specified that hospital drug fee levels should be set to recover the full costs of drugs. A study conducted in 1989 (Waddington 1990) found that utilization of services decreased after fees were introduced, and that the population were unwilling to pay fees if service quality was not improving.

During the past decade, the legislative framework has permitted drug fees to be revised to keep pace with inflation. Other fees, however, have remained at the levels specified in 1985. The continued budgetary pressures and obsolete official fee schedule has resulted in increasingly widespread “local charging practices” by health facilities and “under the table payments to health service providers.

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## 2.3 Safe Motherhood in Ghana

While total fertility has dropped in recent years (from 6.4 in the mid-1980s to 5.5 in the 1990s), there continues to be limited access to quality maternal and neonatal care. The major causes of maternal deaths are hemorrhage, sepsis, obstructed labor, pregnancy-induced hypertension, and unsafe abortion (MotherCare 1998). Studies on barriers to maternal health care use in Ghana indicate that women are at danger of significant morbidity and mortality due to delays in receiving emergency obstetric care at critical points.

One of the national objectives of Ghana's reproductive health policy is to decrease the maternal mortality ratio by 50 percent<sup>5</sup> by 2001. Specific actions taken to achieve this include instituting a Life-Saving Skills Program and forming the National Safe Motherhood Task Force in 1993, ongoing training and refresher training of traditional birth attendants (TBAs), decentralization of emergency obstetric care to districts and subdistricts, and development of Ministry of Health standards (MotherCare 1998).

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<sup>5</sup> The Government of Ghana estimates the maternal mortality rate to be 214 women per 100,000 live births, whereas UNICEF/World Health Organization (WHO) estimates it to be 740 women per 100,000 live births.



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## 3. Costing Issues

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### 3.1 Justification of Costing Maternal Interventions

The overall purpose of this study is to provide information to policymakers on the actual costs of maternal health service delivery between facility levels and public and private providers in Ghana. Such studies assess how well resources are used in facilities and provide policymakers with information on how to improve the efficiency of service delivery.

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### 3.2 Literature Review

Only a small number of studies have been conducted on the costs of maternal health services in developing countries, and very few have been done in sub-Saharan Africa. A wide range of methods have been employed in these studies to measure labor time inputs, use of drugs and supplies, and allocation of joint costs. Several studies (Rosenthal 1991, Family Health International [FHI] 1996, Levin et al. 1997, Dmytrazcenko et al. 1998) have costed maternal health services in facilities through the “ingredient” approach. Using this approach, the costs of all of the inputs used in the delivery of a given service are added up and averaged to determine the unit cost of providing that service. In these studies, total cost per service ranges from \$3.35-\$24.69 for antenatal care to \$55.83-\$118.44 for cesarean delivery.

An important element in these studies is the measurement of personnel time and allocation methods for joint costs to services. Because the cost of labor is a key component of maternal health services and accurate measurement of both contact time and non-contact time is important to determine efficiencies in time use, studies in Ecuador (FHI 1996) and Bangladesh (Levin et al. 1997) utilized provider observation to determine their time allocation among activities. Studies in Bolivia (Rosenthal 1991, Dmytrazcenko et al. 1998) estimated personnel time use through methods such as recall from provider interviews. The disadvantage of the latter method is that the percentage of non-contact time (administrative and personal time as well as non-service days for meetings, trainings, and vacation) for personnel cannot be accurately estimated.

Other studies have costed maternal health services through estimating aggregate costs based on assumptions of input requirements and unit costs (Maine 1991, World Bank 1993, WHO 1998). These studies estimate costs of inputs based on projected needs rather than actual practices and often calculate the costs of providing services at an “optimal” level.

The advantage to costing actual rather than optimal services is that recommendations can be made within a specific country context of financial constraints and varying levels of utilization. The findings can be used to recommend efficiency improvements and to set prices for cost recovery and other financing schemes maternal health services.

As can be concluded from this short review, relatively few studies of the cost of maternal health care have been conducted in developing countries and these studies have used a variety of methodologies. This study in a district of Ghana will attempt to fill part of this gap in cost studies of

maternal health services in African countries through a careful investigation of costs of a package of maternal health services using provider observation methods.

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## 4. Conceptual Framework

The costs of maternal health care can be divided into two types<sup>6</sup>: cost of supplying services and cost to the consumer.

The first, supply costs, can be measured in three ways: one is as the sum of all inputs used in the provision of a given service (total costs) which are useful to planners for budgeting purposes. A second way is looking at the unit costs of delivering a single service (average cost) which allows comparisons to be made among services and among types of health facilities. This study looks at both. The third measure is marginal costs, the additional cost associated with delivering one more unit of service; it takes into account varying costs at different levels of output. Marginal costs cannot be calculated in this study because data were only collected at one point in time.

The inputs, or components, that are used to provide services and need to be costed are the following: personnel time spent providing the service, drugs and supplies, utilities, maintenance and repair, and the cost of equipment and other capital expenses. Some factors that affect provider costs include utilization or scale of service delivery and severity of illnesses. Other factors that affect the costs of providing care in a facility are case mix and treatment protocols for interventions.

Provider costs, whether total or average (or marginal), can be disaggregated into direct and indirect. Direct costs are those that are attributed to health service provision such as employee contact time spent on service delivery, costs of medicines, and costs of supplies for a specific service. Indirect costs are the costs of inputs that support services and are often jointly involved in the provision of several services, such as utilities and maintenance. Joint costs are divided among services using one of several types of allocation methods.

The second type of maternal health costs are those incurred by the consumer. These costs include travel and waiting time, transport fees, service user fees,<sup>7</sup> and other expenditures such as purchase of drugs and supplies by the consumer.<sup>8</sup>

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<sup>6</sup> Even though these two types of costs are part of total costs, they are separated because of their different implications on financing.

<sup>7</sup> It should be noted that the user fees may contain costs that are already included in costs to the provider.

<sup>8</sup> This cost refers to those drugs and supplies that are purchased by clients outside of the facilities and are not part of the user fees.



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## 5. Study Methodology

Clinical interventions costed in this study include routine high volume services like antenatal care and vaginal delivery as well as interventions that address complications and emergencies that may arise during pregnancy, childbirth, and the postpartum period. Due to their contribution to maternal mortality and morbidity and high costs of care, the following complications and emergencies were selected for the study: cesarean section, post-abortion care, postpartum hemorrhage, and eclampsia.

The study involved the collection of data on direct costs of providing maternal services such as personnel time, drugs, laboratory tests, and other supplies used in the intervention as well as indirect costs of service delivery such as administration overhead, utilities, transport maintenance, and supervision.<sup>9</sup> Other data were collected on service quality in the facilities and of community providers in order to control for differences in costs. It should be noted, however, that because the study's main intention was to collect data on costs, only limited data were collected on quality. Data on patient costs also was collected in patient interviews at each of the four facilities covered in this study.

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### 5.1 Direct Costs

Direct costs include those of labor and materials (drugs and supplies).

#### 5.1.1 Labor Costs

In order to obtain information on costs of labor within health facilities, time allocation studies were conducted. Personnel were observed for one week in each facility to determine contact time on maternal services of interest and related non-contact time, such as preparation, recordkeeping and administration. The observation technique that was used to determine the distribution of employees' time among activities is known as randomized intermittent instantaneous observation (Reinke 1988). This method involves observing employees at given (usually three-minute) intervals, and recording the employees' activity at the instant of observation on prestructured forms. The function categories in this study included different health services, such as antenatal care or cesarean section delivery. Activities included procedures that were performed during services (e.g., taking client history, treatment, and counseling) as well as non-contact time such as administrative and personal activities. Using the total number of observations of an employee, the percentage of observations of an employee doing a specific activity or function is calculated and multiplied by the employee's salary to obtain the labor costs for that activity or function.

Observations of different workers are randomized, taking into account the desired frequency of observation. That is, the employees who perform the most diverse and complex activities are observed more frequently so that less common events are more likely to be recorded. For example, a midwife might be observed more often than a nursing aide. In this study, personnel interviews were

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<sup>9</sup> Because insufficient data was available on capital costs, these were not calculated in the study. However, information on the availability and condition of buildings and equipment was collected to control for differences between facilities.

also conducted to determine estimates of non-contact time such as vacation, sick leave, and public holidays.

In order to obtain information from community providers, the study conducted interviews with these providers about the amount of time they spent delivering maternal health services, including both contact and related administrative time. Recall data was considered to be preferable than observation because of the small likelihood of observing an event. The labor costs of private midwives or traditional birth attendants were calculated by subtracting the costs of providing services from total revenues (fees times average annual number of clients).

When activities were not observed because they rarely occurred, such as in the case of obstetrical emergencies, recall data on time use was used to estimate time costs.

### 5.1.2 Drug and Supply Costs

After reviewing alternative methodologies for the estimation of direct costs for drugs and supplies, the investigators adapted the Mother-Baby Package Costing approach (WHO 1998) for calculating these costs.

The methodology for estimating direct material costs involves interviewing health providers to ascertain which lines of treatments are followed in the course of a given intervention, and the percentage of clients that receive each line of treatment. To obtain an estimate of the total cost of delivering an average intervention, such as an antenatal visit, the costs of individual lines of treatment, such as a tetanus toxoid vaccine or folic acid supplements, are aggregated using the percentage of clients receiving that treatment as the weighting factor. Table 1 provides an illustrative example.

The cost of each line of treatment was calculated by multiplying the cost of a single dosage by the number of dosages prescribed in a day and then again by the number of days required to treat a given ailment. Ghana-specific protocols were used in determining dosages. Prices were obtained from the Joint Medical Store or UNICEF, depending on who was the supplier.

**Table 1. Modified Form for Collecting Data on Drugs and Supplies**

Code	Description of Treatment Line	Threat of Miscarriage	Abortion in Course	Sepsis
L	Blood group test	0%	50%	100%
L	Hemoglobin test	0%	80%	100%
M	Blood, one unit	0%	15%	67%
M	Aspirin, tablets 300 mg	0%	0%	0%
M	Gentamicin 40 mg/ml, injection 2ml	0%	0%	33%
M	Ampicillin, injection 1g	0%	0%	67%
M	Ampicillin, tablets 500mg	40%	100%	100%
M	Crystalline penicillin 1MIU	0%	50%	100%
M	Ergometrine maleate, 0.5mg/ml	0%	100%	100%

L=laboratory test M=medicine

The protocol was modified to gather information more effectively in the field. When an intervention was subdivided into the various diagnoses it encompasses (e.g., in the case of abortion complications: threat of miscarriage, abortion in course, and sepsis), providers were better able to quantify the number of clients receiving a given line of treatment for the clinical condition specified. The data collection instrument was, therefore, redesigned to reflect the clinicians' diagnostic approach. This meant that each institution ended up with its own spreadsheet that differed from that of other institutions not only by the percentage of clients receiving various lines of treatment but also by the actual treatments being prescribed. A simplified version of the questionnaire is shown in Table 1.

Unit costs for each diagnostic subcategory were then aggregated at the analysis stage of the work to generate an average unit cost for the intervention as a whole. The percentage of clients admitted under each subcategory was used to weigh that diagnosis's contribution to the intervention's total cost.

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## 5.2 Indirect Costs

Indirect costs include costs of labor and other inputs that support the maternal health service but are not directly involved in service provision; examples are utilities and maintenance. Indirect labor costs are divided into those of personnel involved in caregiving (such as a nurse aide), and other personnel who provide more general support services (such as a clerk). The costs of personnel directly involved in maternal health care were divided into non-contact time (e.g., administrative and personal activities) and non-working days (e.g., meetings, training, and vacation). The costs of other administrative and support personnel such as clerks, administrators, accountants, lab technicians, and cleaners were also calculated by allocating the percentage of their time spent on maternal health care services to specific maternal services.

Non-labor indirect costs that were considered included recurrent costs such as expenditures on maintenance, utilities, rent, and food. Information on recurrent indirect costs were abstracted from facility records.

While some data on equipment and capital investments were collected, this information was insufficient to calculate actual costs. In order to generate annualized capital costs, a more detailed inventory of existing equipment would be required. Nonetheless, this data is useful as an indicator of structural differences between facilities. Therefore, a qualitative description of the data is presented in the section on service quality.

TBA equipment and other capital costs were negligible and are not included in these estimates.

### 5.2.1 Methods of Allocating Indirect Costs

Distinct methods were used to allocate the following indirect costs to individual services: (1) non-contact time of maternal health personnel; (2) time of support personnel who only work on maternal health care services, but who were not observed during the time allocation study; and (3) general administrative and support personnel and other types of indirect costs.

The cost of non-contact time and non-working days of maternal health personnel was allocated to each service according to the percentage of service time spent on each maternal health activity. For

example, if one-third of a midwife's contact time was spent on antenatal care, then one-third of her non-contact time would be allocated to this activity.

The cost of support personnel who provide maternal health care services full-time but whose time use was not observed was allocated to each service by taking the volume of that service as a percentage of the total number of maternal health services, weighted by the length of time required to provide each maternal health activity. The rationale for applying this allocation method is that resource use is positively associated with the average length of time required to deliver care. For example, if cesarean section patients spend an average of eight days at the facility and there are 100 patients (i.e. 800 patient-days), then the percentage of a nurse aide's time that will be allocated to cesarean section will be 800 patient-days divided by the total number of maternal health patient-days. This method avoids the pitfall of allocating a disproportionate amount of indirect cost to high volume, non-resource intensive activities such as antenatal care.

The percentage of total patient-days spent on each type of activity provided at the facility (including non-maternal health services) was also used to allocate the cost of general administrative and support personnel as well as other indirect costs such as maintenance activities to individual service.

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### **5.3 Measures of Quality**

Measures of service quality are included in the study so that cost differences between facilities could be explained. However, since this study was not designed to examine issues of quality in a comprehensive way, and information on process indicators of quality is incomplete, the assessment of service quality is limited. Measures of quality in the study include a combination of structural and process indicators.<sup>10</sup>

Structural service quality is a measure of the extent to which a provider has sufficient equipment and material as well as training to carry out responsibilities adequately. Process service quality in this study measures the extent to which the provider follows standard guidelines, given that the structure is in place. Structural indicators for health facilities included availability of drugs, equipment, and personnel. This information was collected through walk-throughs of facilities with a structured checklist and included the following variables: facility size and space, general cleanliness, availability of key supplies and medicines, availability of standard equipment, and existence and use of systems such as standard treatment protocols, partographs, and recordkeeping.

Process indicators include measures of compliance to guidelines in treatment protocols and client satisfaction. The former is measured through determining the procedures that were adhered to in maternal health interventions when materials were available at the facility. Another measure of process is client satisfaction, which was captured through exit interviews with clients.

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### **5.4 Client Costs**

Using facility-based client exit interviews administered over the course of one week, the average cost to the client for maternal health services were estimated. In addition to questions about direct

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<sup>10</sup> Outcome indicators of quality were not assessed because this information was not collected.

costs to the patient, such as user fees, drugs, supplies, and food related to the visit, questions were asked about travel and waiting time as these can be significant indirect “costs” to the patient. In order to compare client costs to satisfaction, clients were asked to rate the service they had just received in terms of privacy/confidentiality, attitude of health workers, and overall impression with the visit. They were also asked to provide an opinion on how the services at the facility could be improved. Cost recovery rates were calculated using the average user fees paid per service compared to the average cost of the service in each facility.

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## **5.5 Service Volume Data**

Information on service volume in each facility was available for the 12 months of 1997. The data were collected by type of service and included maternal health services as well as other health services provided at the facility.



## 6. Sample and Data Collection

Costing of maternal interventions was undertaken in one district, South Kwahu, located in Eastern Region of Ghana. With its population of 288,000 and a population growth rate of 2.9 percent, South Kwahu is the most populous district in the region. The district has been involved in some safe motherhood activities: (1) In 1994, safe motherhood management protocols and health education guidelines were field-tested; and (2) in 1996, midwives and doctors participated in a project on post-abortion care with a community education component. The district was chosen because it had a range of providers available and services were considered to be of acceptable quality. A table presenting maternal health statistics in South Kwahu District is shown in the Annex A.

In recognition of the various levels of care that deliver safe motherhood interventions, the study focused on health centers, hospitals, and community practitioners. South Kwahu District has one public hospital, one mission hospital, one private hospital, five health centers, eight private maternity homes, and numerous traditional birth attendants. A survey by the MotherCare Africa Initiative Ghana team indicated that structural quality or availability of key drugs and equipment was adequate in the facilities in this district. Obo Health Center and Atibe Hospital were selected to represent public facilities in Kwahu district; Abetifi Health Center and Holy Family Hospital represented non-governmental facilities. The selection criteria for health facilities included high volume service, acceptable quality of maternal services offered, and availability of good financial records (see Table 2). Community-level costing included 20 private midwives and 20 TBAs.

**Table 2. Sample Size of Facilities for Data Collection**

Facility	Services Observed	Average Number of Services per Month (based on service records)	% Total Patient-days for Maternal Health
<b>Public Hospital</b>			
Antenatal Care	63*	257.8	7.0%
Vaginal Delivery	4	51.3	
Cesarean Deliveries	2	13.6	
Post-abortion Complications	0	5.1	
Postpartum Hemorrhage	0	0.3	
Eclampsia	0	0.2	
<b>Mission Hospital</b>			
Antenatal Care	159	928.25	18.0%
Vaginal Delivery	23	146.3	
Cesarean Section	6	21.7	
Post-abortion Complications	0	0.3	
Postpartum Hemorrhage	0	3.8	
Eclampsia	0	0.4	
<b>Public Health Center</b>			
Antenatal Care	9	29.6	9.4%
Vaginal Delivery	0	8.3	
<b>Mission Health Center</b>			
Antenatal Care	29	75.3	4.0%
Vaginal Delivery	2	11.4	

Facility	Services Observed	Average Number of Services per Month (based on service records)	% Total Patient-days for Maternal Health
<b>Private Midwives (20)</b> Antenatal Care Vaginal Delivery	NA	21.4 7.4	NA
<b>Traditional Birth Attendants (20)</b> Antenatal Care Vaginal Delivery	NA	0.1 3.6	NA

\*Observed over five-day period

Data collection instruments developed to collect the relevant data are shown in Table 3. A multi-disciplinary team of social scientists, economists, and clinicians was constituted and trained for data collection. A pre-test of the instruments was conducted in Dodowa before implementing the study in Eastern district. The data were collected during September-November 1998.

**Table 3. Data Sources**

I. Cost Component	Data Collection Technique	# of Providers
Labor	Randomized intermittent instantaneous observation Recall	Four facilities Four facilities + comm pract.
Salaries and Benefits	Record review	Four facilities
Drugs and Supplies (materials)	Provider interviews	Four facilities
Maternal Health Service Utilization	Service record review Provider interviews	Four facilities TBAs
Maintenance and Utility Costs	Record review	Four facilities
Supervisory Costs	Interviews with supervisors	Four facilities
II. Measures of Service Quality	Data Collection Technique	# of Providers
Availability of Equipment and Supplies	Facility walkthrough	Four facilities
Treatment Protocols	Intervention observation	Four facilities
Client Satisfaction	Client exit interviews	Four facilities

The two hospitals provided all six maternal health services being studied, both commonly provided services (antenatal care, vaginal delivery, cesarean section, and post-abortion care) and treatment of less common life-threatening obstetrical complications (postpartum hemorrhage and eclampsia). The health centers and community practitioners provided only routine maternal health services, antenatal care, and vaginal delivery.

The data collection on time allocation of health providers in health centers was relatively simple since all maternal health services took place in one location and only involved determining which health personnel were most essential in the provision of services. In the hospitals, however, maternal health services were provided from three separate locations: antenatal care from a public health unit or clinic area; vaginal delivery, post-abortion, and obstetrical complication services at maternity wards; and cesarean sections at operating theaters.

Observation of health providers in hospitals included four eight-hour periods during daytime shifts and two four-hour periods during evening shifts in the maternity ward as well as two antenatal clinic sessions. While a few cesarean sections were observed in the operating theater at the private hospital, none were observed at the public hospital. In the health centers, four eight-hour shifts were observed.

The study interviewed 20 private midwives and 20 TBAs to collect data on their costs of providing services (e.g., drugs, supplies, rent, etc.), their average time employed, and the number of services they provided each month. A walk-through of the midwives' facilities also was conducted.

Exit interviews were conducted with outpatient and inpatient clients at the hospitals and health centers. Forty outpatients and seven inpatients were interviewed in the public hospital, while 41 outpatients and 20 inpatients were interviewed in the mission hospital. Twenty outpatients were interviewed at the public health center, while 20 outpatients and one inpatient were interviewed at the mission health center.



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## 7. Limitations of the Study

This study is part of a three-country comparison. Due to the funding constraints of this widespread project, the Ghana sample was taken from only one district. In addition to offering some of the best facilities in Ghana, as noted above, it should be noted that South Kwahu differs from other districts since a safe motherhood project was being conducted in this district.

In addition, the sample size of the study is small: two hospitals, two health centers, 20 community providers and 138 clients. Because the facility sample size is small, no statistical tests of the costs of providing services were conducted. It is a case study rather than a representative sample.



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## 8. Results

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### 8.1 Direct Costs

Direct costs include the costs of labor and materials—drugs and supplies—used in delivering services. This section looks at the direct costs of routine services and of obstetrical complications.

#### 8.1.1 Direct Cost of Routine Services

Routine services examined by this study are antenatal care and vaginal delivery. They are provided by all four types of facilities in the study. Table 4 shows that direct costs of routine services ranged from \$2.46 for antenatal care at the public health center to \$9.59 for vaginal delivery at the public hospital. More specifically, the unit direct costs ranged from \$2.46 to \$3.36 for antenatal care, and from \$3.79 to \$9.59 for vaginal delivery. As will be seen below, costs were lower for these services than for obstetrical complications.

**Table 4. Direct Costs of Routine Maternal Health Services by Facility**

	Public Hospital	Mission Hospital	Public Health Center	Mission Health Center
<b>ANC</b>				
Labor	\$0.77	\$0.40	\$0.52	\$0.60
Materials	\$2.59	\$2.09	\$1.94	\$2.37
TOTAL	\$3.36	\$2.49	\$2.46	\$2.97
<b>Vaginal Delivery</b>				
Labor	\$2.02	\$1.88	\$1.03	\$1.40
Materials	\$7.57	\$7.26	\$2.76	\$5.40
TOTAL	\$9.59	\$9.14	\$3.79	\$6.80

Variation in labor costs reflects the amount of time spent on specific services, levels of personnel who provide services, and staffing patterns of maternal health providers. Unit labor costs at the four facilities ranged from \$0.40 to \$0.77 for antenatal care and from \$1.03 to \$2.02 for vaginal delivery. The unit labor costs for delivery were higher than those for antenatal care because deliveries demand more personnel time. The higher costs at hospitals than at health centers reflect the use of a larger number of highly skilled personnel. (Section 8.6.2 describes staffing patterns.)

Because maternal health care drugs are costly and personnel salaries are low, material costs comprise a larger percentage of direct costs than do labor costs. Material costs (drugs and supplies) made up the majority of costs for both routine services; in fact, they were two to five times greater than labor costs.

The costs of drugs and supplies were relatively similar for antenatal care (\$1.94-2.59) in the four facilities but varied for vaginal delivery, being lowest at the public health center (\$2.76) and highest at the public hospital (\$7.57). The costs of drugs and supplies for delivery were higher at the hospitals since more drugs were used and additional procedures, such as labor induction, were conducted.

When looking at service cost differentials between hospitals and health centers, direct costs for antenatal care were found to be similar in all four facilities: on average, \$2.72 in health centers and \$4.92 in hospitals. Vaginal delivery costs, however, showed greater differential between the hospitals and health centers; the average unit costs were 43 percent higher at hospitals. This is attributable to hospitals' use of more highly skilled personnel and drugs.

No clear pattern of direct cost differences between public and mission facilities was found. The unit costs of routine services were higher at the mission center than at the public one, but lower at the mission hospital than at the public hospital. The higher costs at the mission health center were due to the use of more drugs and supplies, while the higher costs at the public hospital were due to the use of more personnel and materials.

## 8.2 Direct Costs of Obstetrical Complications

The study also calculated the direct costs of treating of selected obstetrical complications<sup>11</sup>: cesarean section, postpartum hemorrhage and post-abortion complication (Table 5). Because these conditions occur infrequently, the time that health personnel spend on provision of their treatment was not observed;<sup>12</sup> instead, the labor costs were calculated based on recall data of the amount of time spent on provision of this service.

**Table 5. Direct Unit Costs of Obstetrical Complications by Facility**

	Public Hospital	Mission Hospital	Public Health Center	Mission Health Center
<b>Cesarean Section</b>				
Labor	\$12.55	\$8.65	NA	NA
Materials	\$51.20	\$38.02		
TOTAL	\$63.75	\$46.67		
<b>Post-abortion Complications</b>				
Labor	\$5.00	\$2.40	NA	NA
Materials	\$43.55	\$41.80		
TOTAL	\$48.55	\$44.20		
<b>Postpartum Hemorrhage</b>				
Labor	\$29.69	\$3.35*	NA	NA
Materials	\$36.48	\$25.78		
TOTAL	\$66.17	\$29.13		

\*The estimate of personnel time spent on treatment of postpartum hemorrhage may have been underestimated.

<sup>11</sup> Eclampsia was not costed in this study because insufficient information on unit costs was obtained from respondents. However, in 1997/98 a few cases were reported at the hospitals: two cases at the public hospital and five at the mission hospital.

<sup>12</sup> Although a cesarean section was observed at the Holy Family Hospital, the time use of doctors was not recorded.

The direct unit costs of obstetrical complications ranged from \$29.13 to \$66.17 and were higher at the public than mission hospital because of use of more materials and more personnel (see section 8.6.2 for comparison of staffing). Unit costs of cesarean section provision were \$63.75 at the public hospital and \$46.67 at the mission hospital, those of treating post-abortion complications \$48.55 and \$44.20, respectively, and those of treating postpartum hemorrhage \$66.17 and \$29.13.

As with vaginal deliveries, the direct costs of obstetrical complications were high because of the costly materials required to provide these services. The material costs ranged between \$25.78 for postpartum hemorrhage in the mission hospital to \$51.20 for cesarean section at the public hospital.

It should be noted that these complications are rarely seen because many cases never reach the hospitals. This problem of inadequate access is attributable to lack of emergency transport and poor roads, and to economic barriers. If transport could be improved and other barriers mitigated, it is likely that the number of cases with complications would increase. This more cost-intensive case mix would raise the total costs of providing maternal health services at hospitals. The extent to which the hospitals would be adversely affected would depend on cost recovery ratios and cross-subsidization from other services. In addition, it would have some implications on the provision of services from health centers and hospitals.

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### **8.3 Indirect Costs**

Indirect costs (Table 6) include the costs of labor non-contact time, i.e., the costs of time spent on administrative and personal activities and on outside meetings, training, and vacation; the costs of “other” (supervision and support) personnel; and the cost of maintenance and utilities. These costs are an indicator of the service mix and size of facility. Indirect costs decrease as service volume increases since these costs are spread over more services.

Unit indirect costs ranged from \$0.48 to \$5.01 for routine services and from \$8.44 to \$26.77 for treatment of obstetrical complications. The indirect costs of treating obstetrical complications are higher than for routine services because of longer lengths of stay and more time spent by other personnel.

For the routine services of antenatal care and vaginal deliveries, the most costly component of indirect costs at all facilities was labor non-contact time except for vaginal delivery at the public health center. Labor non-contact time also was more costly than “other” personnel costs for obstetrical complications, except for cesarean section and post-abortion complications at the public hospital, probably due to the low service volume at that facility.

**Table 6. Unit Indirect Costs of Maternal Health Services by Service and Facility**

	<b>Hospitals</b>		<b>Health Centers</b>	
	<b>Public Hospital</b>	<b>Mission Hospital</b>	<b>Public Health Center</b>	<b>Mission Health Center</b>
<b>Antenatal Care</b>				
Labor Non-contact Time	\$1.75	\$0.43	\$0.56	\$1.01
Other Personnel	\$0.20	\$0.03	\$0.08	\$0.03
Maintenance and Utilities	\$0.14	\$0.02	\$0.07	\$0.02
<b>TOTAL</b>	<b>\$2.09</b>	<b>\$0.48</b>	<b>\$0.71</b>	<b>\$1.06</b>
<b>Vaginal Delivery</b>				
Labor Non-contact Time	\$2.53	\$2.00	\$0.82	\$1.45
Other Personnel	\$1.45	\$0.43	\$1.62	\$1.02
Maintenance and Utilities	\$1.03	\$0.32	\$1.43	\$0.47
<b>TOTAL</b>	<b>\$5.01</b>	<b>\$2.75</b>	<b>\$3.87</b>	<b>\$2.94</b>
<b>Cesarean Section</b>				
Labor Non-contact Time	\$5.20	\$3.66	NA	NA
Other Personnel	\$11.60	\$3.03		
Maintenance and Utilities	\$8.28	\$2.24		
<b>TOTAL</b>	<b>\$25.08</b>	<b>\$8.93</b>		
<b>Post-abortion</b>				
Labor Non-contact Time	\$5.49	\$14.41	NA	NA
Other Personnel	\$7.25	\$3.03		
Maintenance and Utilities	\$5.17	\$2.24		
<b>TOTAL</b>	<b>\$17.91</b>	<b>\$19.68</b>		
<b>Postpartum Hemorrhage</b>				
Labor Non-contact Time	\$14.35	\$6.18	NA	NA
Other Personnel	\$7.25	\$1.30		
Maintenance and Utilities	\$5.17	\$0.96		
<b>TOTAL</b>	<b>\$26.77</b>	<b>\$8.44</b>		

Among the four facilities, indirect costs were lowest at the mission hospital. This can probably be attributed to the higher service volume at this institution (see Table 8)—two to three times the volume at the public hospital, with the exception of post-abortion complications—which spreads the costs are among more services.

As was the case with direct costs, the study found no clear pattern of indirect cost differentials in public and mission facilities. Mission health center costs were higher than public health center costs for antenatal care and vaginal delivery services. Public hospital costs were higher than mission hospital costs for four out of five services; the exception was post-abortion services, attributable to its low service volume at the mission hospital.<sup>13</sup>

## 8.4 Total Costs at Four Facilities

Table 7 presents the unit total costs of the five maternal health services provided at the four facilities. These costs varied widely and ranged from \$2.97 for an antenatal care service at the mission hospital to \$92.94 for treatment of postpartum hemorrhage at the public hospital.

<sup>13</sup> It is likely that the number of cases of treatment of post-abortion complications is underreported at the mission hospital since only three cases were reported.

**Table 7. Unit Total Costs of Services at Four Facilities**

Service	Hospitals		Health Centers	
	Public Hospital	Mission Hospital	Public Health Center	Mission Health Center
Antenatal Care	\$5.45	\$2.97	\$3.17	\$4.03
Vaginal Delivery	\$14.60	\$11.89	\$7.66	\$9.74
Cesarean Section	\$88.83	\$55.60	NA	NA
Post-abortion Complication	\$66.46	\$63.88	NA	NA
Postpartum Hemorrhage	\$92.94	\$37.57*	NA	NA

\*The costs at the mission hospital are low probably due to an underestimate to time spent by labor on this service.

On average, unit costs were higher at hospitals than at health centers due to the use of more drugs and a greater number of higher-level personnel. The exception was the low unit cost of antenatal care at the mission hospital due to high service volume.

When the total costs at the two public and two mission facilities were compared, they were found to be on average a third higher at the mission health center than the public one and a third higher at the public hospital than the mission hospital. The costs were higher at the public hospital than mission hospital due to greater use of materials and lower service volume. For the health centers, the costs at the mission health center were higher than the public one due to the use of more materials and more staff.

## 8.5 Costs of Community Practitioners

The unit costs of service provision were also estimated for the 20 private midwives and 20 traditional birth attendants. This service provision differs from that provided at facilities since it is provided either from the homes of the practitioners or at the clients' homes and involves fewer overhead costs.

The average unit costs of services provided by private midwives were \$3.02 and \$12.71 for antenatal care and delivery, respectively (Table 8). These costs were similar to those for services provided at health centers for antenatal care but higher for delivery due to higher labor costs.<sup>14</sup>

The material costs of routine service delivery were compared for private midwives and health centers. The costs of the materials used by private midwives for antenatal care were about half those at health centers, since fewer materials were used.<sup>15</sup> Material costs for delivery were between the costs at the public health center and mission health center.

<sup>14</sup> It should be noted that labor costs of private midwives and those at health centers are not strictly comparable since methods of calculation are different.

<sup>15</sup> As noted in the section on availability of drugs and equipment, 75 percent of private midwives had all key drugs for antenatal care available and 85 percent had key drugs for vaginal delivery.

**Table 8. Average Unit Cost of Services Provided by Private Midwives and TBAs**

	Private Midwife	TBA
<b>Antenatal Care</b>		
Labor	1.56	NA
Materials	1.13	0.16
Other Personnel	0.33	0.14
TOTAL	3.02	0.30
<b>Vaginal Delivery</b>		
Labor	8.81	3.23
Materials	3.55	0.26
Other Personnel	0.39	0.23
TOTAL	12.75	3.72

The unit costs of services provided by TBAs were significantly lower than those of private midwives and health centers. The reason is that they used fewer materials and other personnel (only three had assistants). The main cost for TBA services was labor. However, it should be noted that even though TBA services were less costly than those provided by other providers, TBAs lacked key drugs and supplies and did not provide the same service quality as other providers.

## 8.6 Quality of Care of Providers

In assessing the relationship between quality and cost, certain aspects of quality are considered likely to affect average recurrent costs of services: provision of materials, use and maintenance of equipment, use of standard protocols, and staffing patterns.

### 8.6.1 Structural Quality

The study conducted an assessment of the first two aspects of quality, availability of materials and equipment, in the four facilities and for the community practitioners; findings are shown in Table 9. The information for TBAs is not included in the table since they did not have any of the key drugs, except paracetamol, and did not have key equipment.

Most of the key drugs and equipment were available in the four facilities and for the private midwives. While the hospitals had all key drugs, the health centers had most drugs, and the midwives had on average 75 percent of antenatal care drugs and 85 percent of delivery drugs. Similarly, the hospitals had all of the key equipment needed to provide services, while the health centers and midwives had most of the key equipment required for antenatal care and obstetrics. The equipment that was least likely to be available were autoclaves.

**Table 9. Availability of Drugs and Equipment in Health Facilities**

	Public Hospital	Mission Hospital	Public H.C.	Mission H.C.	Private Midwives
<b>Key Drugs</b>					
Antenatal Care*	3/3	3/3	3/3	3/3	75%
Delivery**	3/3	3/3	3/3	3/3	85%
Cesarean Delivery***	4/4	4/4	4/4	2/4	NA
Other ****	3/3	3/3	2/3	2/3	NA
<b>Prescribed drugs received at exit by clients</b>					
All drugs	87%	100%	84%	85%	NA
Some drugs	8%	0%	16%	15%	
None	3%	0%	0%	0%	
<b>Equipment</b>					
Antenatal Care:			Yes		
Fetoscope	Yes	Yes	Yes	Yes	100%
Blood pressure cuff	Yes	Yes	Yes	Yes	90%
Adult weighing scale	Yes	Yes		Yes	100%
Obstetrics:					
Working autoclave	Yes	Yes	No	No	45%
Needle holder	Yes	Yes	Yes	Yes	80%
Stitch scissors	Yes	Yes	Yes	No	85%
Forceps (dissecting)	Yes	Yes	Yes	Yes	90%
Baby weighing scale	Yes	Yes	Yes	Yes	95%

\* The key drugs for antenatal care were tetanus toxoid, ferrous sulfate, and folic acid.

\*\* The drugs for delivery include paracetamol or aspirin, dextrose, and lidocaine.

\*\*\* The drugs for cesarean section include antibiotics, dextrose, oxytocin, and diazepam.

\*\*\*\* Drugs for other procedures include oxytocin, diazepam, and hydralazine.

Another indicator of whether key drugs were available and of whether they were being dispensed was whether clients received the drugs that they were prescribed. Most facility clients<sup>16</sup> (84 percent or more) reported that they had received the drugs that they were prescribed. They were most likely to have received the prescribed drugs at the mission hospital.

The study also assessed whether standard procedures were being followed in all four facilities. In general, all facilities appears to be maintaining sterile fields during procedures. A few procedures that were not followed in all four facilities are shown in Table 10. These include conducting pelvic assessments for antenatal care and laboratory tests upon admission for delivery. The mission hospital was the only facility where both procedures were conducted. Pelvic assessments were done in the public hospital and mission health center.

**Table 10. Process Indicators in the Four Facilities**

Process Indicator	Public Hospital	Mission Hospital	Public Health Center	Mission Health Center
Pelvic assessment for antenatal care	Yes	Yes	No	Yes
Lab work for vaginal delivery	No	Yes	NA*	No

\*No delivery was observed during the week spent at this facility.

<sup>16</sup> Since clients of private midwives were not interviewed, this indicator could not be measured for them.

Another factor that affects the quality of a facility is the number of amenities it offers. For example, the mission hospital was the only facility to have curtains and screens so that a client could have privacy during examinations.

### **8.6.2 Staffing Patterns**

Staffing patterns affect not only the unit costs and therefore the efficiency of service delivery, but also the quality of service delivery. If resources are not used efficiently, costs will be higher than necessary. For example, if a facility is overstaffed for the number of clients that it receives, then the labor costs will be high. If, on the other hand, the minimum number of staff necessary to provide services is not available at the facility, costs will be low but the quality of service provision will be inadequate.

Table 11 shows the staffing patterns of the personnel in the facilities as well as community practitioners. If the standard that a nurse/midwife should be able to provide approximately 1000 antenatal cases per year and attend 150-200 deliveries per year in an institutional setting is assumed,<sup>17</sup> then the public hospital was overstaffed since each of its midwives provided only 28 deliveries on average per year, with 150 deliveries performed by approximately five midwives. The mission hospital, on the other hand, had about the right number of staff for the number of deliveries that were provided at the facility.

The health centers have lower service provision and correspondingly fewer staff. Given the lower service provision, the number of personnel is about right for the health centers, since they must have a second midwife/nurse to replace the first at night and on weekends and holidays.

While not strictly comparable to facilities, the staffing patterns of community practitioners provided a mean annual volume of 88 deliveries, and TBAs provided 43 deliveries. While most private midwives had assistants, most TBAs did not.

Another criterion is the availability of laboratory personnel. While the two hospitals had sufficient personnel to conduct laboratory tests, the health centers did not have personnel allocated to the laboratory. Despite this, they conducted laboratory tests for antenatal care.

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<sup>17</sup> However, it should be noted is that, in many cases, other staff such as nursing assistants are providing these services when the midwife is not available.

**Table 11. Use of Personnel in Health Facilities**

Facility	# of services provided in 1997	# of midwives	# of doctors/specialists	# of support staff	# of Lab Workers	# midwives/150 deliveries
Public Hospital	3,094 ANC 615 deliveries 163 cesarean sections	22	1 doctor 1 specialist	1 nursing aide 10 support staff	3 lab assistants. 1 lab technician 1 lab technician	5.4
Mission Hospital	11,139 ANC 1,756 deliveries 260 cesareans sections	14	1 doctor 1 specialist	12 ward assistants 2 orderlies	2 lab technicians 11 lab assistants	1.2
Public Health Center	355 ANC 100 deliveries	1 midwife 1 nurse	1 medical asst.	1 ward assistant		1.5
Mission Health Center	903 ANC 137 deliveries	2	1 medical assistant	3 orderlies		2.2
Private Midwives	257 ANC 88 deliveries	1	NA	1*	NA	1.7
TBAs (20)	1.2 ANC 43 deliveries	1 TBA	NA	0*	NA	NA

\*Some 87 percent of the private midwives had assistants while only three of the TBAs had an assistant.

### 8.6.3 Amount of Time spent on Non-Service Activities

The study also assessed the use of time of key facility personnel to determine how efficiently they were used and the impact on quality. If staff spends most of their time on either administrative tasks or unoccupied/personal time, they are not with patients and their time may not be used in the most productive way. Administrative activities includes recordkeeping, meetings, and preparation. Unoccupied time includes tea breaks and chatting.

Table 12 shows the percent of total time spent by personnel on administrative duties and unoccupied. The amount of time spent on administrative activities was high, particularly for the senior midwife and midwife and at the public hospital and mission health center. It should be noted, however, that senior midwives would be expected to spend more of their time on administrative activities than midwives since they have supervisory responsibilities. For senior midwives, the percentage of time spent on administrative activities ranged from 21.44 percent to 55 percent, while the midwives spent 9 percent to 38 percent of their time on this activity. Ward attendants spent only 10 percent to 25 percent of their time engaged in administrative activities.

**Table 12. Percent of Time spent by Key Personnel on Administrative Work and Non-work Activities, by Facility**

	Public Hospital	Mission Hospital	Public Health Center	Mission Health Center
<b>Senior Midwife</b>				
Administrative	53%	21.4%	NA*	55%
Unoccupied	9%	6.3%		4.1%
<b>Midwife</b>				
Administrative	38%	18.7%	8.6%	37.5%**
Unoccupied	5.2%	1.8%	17.8%	12.5%
<b>Ward Attendant</b>				
Administrative	25%	9.6%	NA*	10.9%
Unoccupied	3%	6.3%		22.7%

\*No employee of this type was observed.

\*\*Enrolled nurse who provided maternal health care.

Health personnel spent from 2 percent to 23 percent of their time unoccupied, with variation among types of employees and by facility and appeared to be reasonable in most cases. The senior midwives spent on average 5.1 percent of their time unoccupied (4 percent-9 percent), the midwives 9.3 percent (2 percent-18 percent), and the ward attendants 10.6 percent (3 percent-25 percent).

Health personnel were more likely to be unoccupied in the health centers than in the hospitals, presumably because service volume was lower. The two cases where the amount of time spent unoccupied was above 15 percent were in health centers, the midwife in the public health center, and the ward attendant in the mission health center.

## 8.7 Costs to Client by Service

Data on user fees and other direct costs were collected from patients who received antenatal care services (first and follow-up visits), those who had a delivery (vaginal or cesarean), and those receiving services for obstetrical or post-abortion complications. Table 13 provides a summary by facility of the average user fees paid, travel costs, other costs (including the cost of food and outside drugs and supplies associated with the visit), as well as the average total cost paid by the client for each type of service. Because the clients were interviewed before they left the facility, travel costs were assumed to be double the cost paid by the client to reach the facility. No travel costs for companions who accompanied the client to the facility were included. The numbers in italics (N) designates the number of cases in the sample in each facility.

**Table 13. Average Cost to Client by Service and Facility**

	Public Hospital	Mission Hospital	Public Health Center	Mission Health Center
<b>Antenatal Care – First Visit (N)</b>	(9)	(15)	(4)	(8)
User Fees Paid	\$3.18	\$3.05	\$0.49	\$0.73
Travel Costs	\$0.54	\$0.57	\$0.21	\$0.08
Other Costs	\$0.04	\$0.04	\$0.00	\$0.04
Average Total Cost/Client	\$3.75	\$3.66	\$0.70	\$0.92
<b>Antenatal Care – Follow-up (N)</b>	(30)	(25)	(15)	(10)
User Fees Paid	\$1.62	\$1.79	\$0.45	\$0.57
Travel Costs	\$0.66	\$0.72	\$0.09	\$0.00
Other Costs	\$0.06	\$0.15	\$0.01	\$0.06
Average Total Cost/Client	\$2.35	\$2.65	\$0.55	\$0.63
<b>Antenatal Care – Total (N)</b>	(39)	(40)	(19)	(18)
User Fees Paid	\$2.40	\$2.42	\$0.47	\$0.65
Travel Costs	\$0.60	\$0.64	\$0.15	\$0.08
Other Costs	\$0.05	\$0.09	\$0.00	\$0.05
Average Total Cost/Client	\$3.05	\$3.15	\$0.62	\$0.78
<b>Vaginal Delivery (N)</b>	(2)	(9)	—	—
User Fees Paid	\$11.77	\$18.10	—	—
Travel Costs	\$0.75	\$1.35	—	—
Other Costs	\$0.00	\$1.19	—	—
Average Total Cost/Client	\$12.52	\$20.64	—	—
<b>Cesarean Delivery (N)</b>	(3)	(2)	—	—
User Fees Paid	\$66.97	\$117.50	—	—
Travel Costs	\$1.25	\$11.67	—	—
Other Costs	\$0.14	\$10.42	—	—
Average Total Cost/Client	\$68.39	\$139.58	—	—
<b>Obstetrical Complications (N)</b>	—	(4)	—	—
User Fees Paid	—	\$8.39	—	—
Travel Costs	—	\$1.13	—	—
Other Costs	—	\$1.93	—	—
Average Total Cost/Client	—	\$11.44	—	—
<b>Post-abortion Care (N)</b>	(1)	(1)	—	—
User Fees Paid	\$18.20	\$12.50	—	—
Travel Costs	\$0.58	\$1.67	—	—
Other Costs	\$0.00	\$0.00	—	—
Average Total Cost/Client	\$18.78	\$14.17	—	—

Note: The number in *italics* (N) designates the number of cases in the sample in each facility.

Client costs for antenatal care services varied from only \$0.62 at the public health center to \$3.15 at the mission hospital. The costs for first visit antenatal care services were greater than follow-up visits in all facilities; 27 percent greater in the public health center and 60 percent greater in the public hospital. In all facilities, user fees made up the majority of the average total cost/client, more than 75 percent of the costs in all cases. Other direct costs as a proportion of average total cost were less than 25 percent in all facilities. At public hospital, other direct costs were less than 6 percent of average total cost.

No costs to clients for deliveries were captured at the health facility level. At the hospitals, average total costs of vaginal delivery services ranged from \$11.77 in the public hospital to \$18.10 in the mission hospital. Average total costs of cesarean deliveries ranged from \$66.97 (based on three patients responding) in the public hospital to \$117.50 in the mission hospital (two patients responding). Other direct costs for both vaginal and cesarean delivery in the public hospital were smaller than in the mission hospital. For vaginal delivery, user fees accounted for 94 percent of the

total costs in the public hospital and 87 percent in the mission hospital. User fees for cesarean section made up 97 percent of the costs in the public hospital and 84 percent in the mission hospital.

Data on costs to clients of obstetrical and post-abortion complications are also less reliable because fewer clients were interviewed. Average total cost for obstetrical complications in the mission hospital was \$11.44. No clients receiving care for obstetrical complications (except post-abortion complications) were available for interview in the public hospital. For post-abortion care, one client in the public hospital paid a total of \$18.78, while a client in the mission hospital paid \$14.17. As seen with the cost of deliveries, user fees accounted for the majority of the costs—73 percent of average total costs of obstetrical complications in the mission hospital, 96 percent and 88 percent of average total costs of post-abortion care services in the public and mission hospitals, respectively.

The average user fees charged by community practitioners are shown in Table 14. For private midwives, the average fee is \$2.08 for antenatal care and \$8.99 for delivery services. The fees for antenatal care are higher than those charged at health centers but comparable to those charged at hospitals. The fees for delivery are higher than those charged at health centers (\$1.88 and \$2.71), but lower than those charged at hospitals.

The fees charged by TBAs were for delivery services, since most did not provide any antenatal care. The mean fee was \$3.41 and median fee was \$2.08. The fees charged by TBAs are similar to those charged at health centers.

**Table 14. User Fees Charged by Community Practitioners**

	Private Midwives	TBAs
<b>Antenatal Care</b>		
Median	C5000(\$2.47)	NA
Mean	C5925(\$2.08)	
Range	C2000-20,000(\$1.04-\$8.33)	
<b>Vaginal Delivery</b>		
Median	C21250 (\$8.85)	C5000(\$2.08)
Mean	C21,575 (\$8.99)	C8190 (\$3.41)
Range	C3500-35000(\$1.46-\$14.58)	C3000-22500(\$1.25-\$9.38)

Note: C is for cedis, the currency in Ghana.

### 8.7.1 Waiting Time for Antenatal Care Services

Patients were asked how long they had to wait before they obtained antenatal care. Average reported waiting times varied considerably, ranging from two to 34 minutes. At the two hospitals, reported waiting times for all antenatal care services were 30 minutes at the public hospital and three minutes at the mission hospital. At the two health centers, waiting times were estimated by patients to be 32 minutes at the public center and 30 minutes at the mission center. However, in a related question asking how services could be improved, only one of 149 respondents at the public health center suggested that waiting time be shortened.

### 8.7.2 Travel Time

Patients were asked how long it took them to travel one way to the facility from their home via the mode of transport they had used that day. Table 15 provides a summary of round-trip travel time in minutes by type of service.

**Table 15. Average Round Trip Travel Time by Facility and Type of Service**

	Public Hospital	Mission Hospital	Public Health Center	Mission Health Center
All Antenatal Care Services	58	70	28	44
Vaginal Delivery	30	62	—	—
Cesarean Delivery	50	166	—	—
Obstetrical Complications	—	60	—	—
Post-abortion Care	40	120	—	—
All Services	45	96	—	—

Reported travel times indicate that most patients seeking maternal health services live more than 15 minutes away from the facilities, and up to 83 minutes from their preferred health facility. Round-trip travel time adds from 28 to 70 minutes to a routine antenatal care visit.

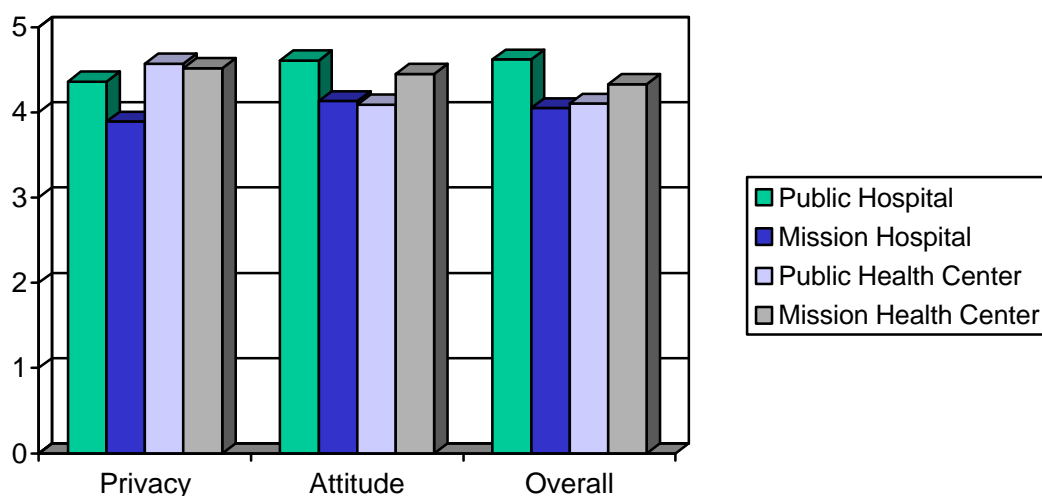
Travel time is considered to be a price to consumers and affects their decision making in choosing a facility. However, the sample size in this study was too small to establish the relationship between use and distance. Further research beyond the scope of a patient interview is necessary to fully explain the time clients spend traveling to each facility and their choice of facility based on travel time.

### 8.7.3 Client Satisfaction

The patient exit interview included several questions regarding client satisfaction. Clients were asked to rank privacy/confidentiality, attitude of health personnel, and their overall impression of their visit as very good, good, satisfactory, fair, or poor. Patients were then asked how the services they received could be improved.

In general, on the five-point scale of very good (5), good (4), satisfactory (3), fair (2), and poor (1), the majority of patients in the four facilities reported that they were satisfied. Average scores for privacy/confidentiality, health worker attitude, and overall impression of the facility ranged from 3.89 to 4.68. As seen in Figure 1, despite little variance, the mission hospital scored low in all three categories, the lowest of all four facilities on privacy and overall impression. The public hospital scored highest for health worker attitude and overall impression than the other three facilities. Overall, the public hospital scored higher than the mission hospital, while the mission health center scored higher than the public health center (in two out of three categories).

**Figure 1. Client Satisfaction by Facility**



The most frequently mentioned improvements suggested by clients at the public hospital in descending order included more drugs available (19 percent), more or better advice (13 percent), better health worker attitude (8 percent), and better staff (8 percent). At the mission hospital, the top three suggested improvements included more drugs available (12 percent), better health worker attitude (10 percent), and more or better advice (9 percent). At the public health center, 23 percent of the patients interviewed suggested that more drugs be available, while 19 percent requested laboratory facilities and 12 percent asked for better staff. Twenty-two percent of the improvements suggested at the mission health center were related to the need for more drugs, while 13 percent of respondents requested more or better advice. At the mission health center, 9 percent of respondents suggested that no improvements were needed. At the other three facilities, less than 1 percent of respondents suggested that no improvements were necessary.

## 8.8 Cost Recovery

The percentage of operating costs recovered through fees at each facility are provided in Table 16 below. The rates vary widely: they ranged from 15 percent to 81 percent for antenatal care at the four facilities and were 81 and 152 percent for vaginal delivery in the public and mission hospitals, respectively. The rates for treatment of obstetrical complications were 27 percent and 75 percent for cesarean section, and 20 percent and 27 percent for post-abortion complications in the public and mission hospitals, respectively.

**Table 16. Cost Recovery Rates by Service and Facility**

	Public Hospital	Mission Hospital	Public Health Center	Mission Health Center
Antenatal Care	44%	81%	15%	16%
Delivery	81%	152%	NA	NA
Cesarean Section	75%	211%	NA	NA
Post-abortion Complication	27%	20%	NA	NA

The cost recovery rates were highest at the mission hospital, followed by the public hospital, and then health centers. The rates at the mission hospital were two to three times larger than those at the public hospital for all but one service, due to higher fees and lower operating costs. Despite its lower cost recovery rates, the public hospital was covering the bulk of its operating costs for delivery and cesarean section services, partially because its fees are tied to the price of drugs used in specific interventions. The health centers, on the other hand, had cost recovery rates of less than 20 percent for antenatal care.

The results in all of the facilities studied, however, provide empirical evidence to both policymakers and clients that in fact the costs of providing maternal health services are not covered entirely by client user fees.

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## 9. Discussion

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### 9.1 Costs of Service Delivery

The study found considerable variation in the costs of service provision at the four facilities, both between levels and in public vis-à-vis mission facilities. While it is difficult to draw inferences from total costs of services on relative costs, efficiency, and quality, some conclusions emerge from a comparison of the direct costs of labor and materials as well as indirect costs in the four facilities.

The unit cost analyses indicated that material (drugs and supplies) costs were high compared to other costs and comprised over three-quarters of direct costs for all but one service provided. The costs of labor, on the other hand, were relatively low due to low personnel salaries and staffing patterns.

Direct costs differed between hospitals and health centers. The direct costs of routine services were higher at the hospitals than at health centers, reflecting hospitals' greater use of drugs and personnel. It should be noted that health centers are only equipped to provide basic treatment for routine services.

Differences in direct costs were found between the two public and the two mission facilities. The costs were higher at the mission health center than the public health center, because of use of more materials. On the other hand, costs were higher at the public hospital than at the mission hospital due to greater use of materials and personnel at the former. This finding suggests that resources are more concentrated at the public hospital.

Indirect costs made up a significant portion—16-38 percent—of total costs. Indirect costs were related to the service volume at the facilities and were lowest at the mission hospital due to its relatively high service volume.

In general, the non-labor cost of services provided by private midwives was similar to those provided at the four facilities. More specifically, their cost was similar to the cost at health centers for antenatal care, and between the costs of the public and mission health centers for delivery services.

For routine services, the direct costs of traditional birth attendants were less than those of other providers. However, it should not be concluded that they are a cost-effective alternative to other providers, since they lacked key drugs and equipment and provided antenatal care only infrequently. Instead, they should be used when other options are not available.

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### 9.2 Efficiency of Service Delivery

The study observed inefficient use of labor resources in some facilities. For example, in the public hospital, the number of midwives is higher than necessary, given the number of deliveries that took place. Overstaffing makes the services unnecessarily expensive.

Two approaches can be taken to alleviate the problem of overstaffing of maternal health personnel at the public hospital: (1) the number of staff can be decreased, through attrition, or re-assignment to other, busier wards, and (2) the service volume for maternal health can be increased. If the number of staff at the hospital is decreased, then the unit cost of labor for services will decrease. Similarly, if the service volume is increased at the facility, then the indirect costs will be divided among more services, and, again, the unit costs will decrease.

The health centers, particularly the public health center, have low service utilization, especially for deliveries. If the service volume at these facilities were increased, particularly deliveries, then the unit costs could be reduced.

Another efficiency issue is the amount of time that health personnel spent on administrative activities. Assuming that more than 30 percent of time spent on administrative work is too much, then both the senior midwives and enrolled midwives in the public hospital and mission health center are spending too much time on administrative activities. If the process could be streamlined, then these employees could spend more time on service provision. However, it will also be important to increase the service volume at these facilities.

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### **9.3 Quality of Service Delivery**

In general, the findings regarding the indicators of service quality, measured by availability of key drugs and equipment and use of standard protocols, suggest that quality is at a reasonable level for all four facilities. One factor that probably affects structural quality indicators in public facilities is the “cash-and-carry” program for drugs, which increases the likelihood that drugs are available.<sup>18</sup> Although little variation on process indicators was found among the facilities, the mission hospital scored best in this regard; i.e., it was more likely to have prescribed drugs available, had shorter waiting times for services, and was the only facility to have curtains and screens for privacy).

Clients were more satisfied with the services provided at the public than at the mission hospital, possibly because of the lower user fees and smaller client volume. They were also more satisfied with services received at the mission health center than at the public health center.

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### **9.4 Client Costs**

Costs to the client were highest at the mission hospital, followed by those at the public hospital. They were substantially lower at health centers. Despite the higher costs, however, the mission hospital has the heaviest service volume of the four facilities, suggesting that clients are willing to pay for services if they think the service is of reasonable quality.

For antenatal care, client costs at health centers were one-fifth of those at hospitals. One strategy to promote the use of health centers for maternal health care would be to emphasize the advantage of lower costs<sup>19</sup> and shorter travel times.

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<sup>18</sup> Despite the fact that key drugs and supplies were available in all of the facilities, though, 12-23 percent of clients suggested that more drugs should be available.

<sup>19</sup> However, if clients associate value with costs, then they may prefer to go to the hospitals.

User fees comprised over 50 percent of total client costs. Other costs to the client, including travel, made up less than 30 percent of their costs. Clients paid more travel costs to go to the mission hospital than the public hospital, perhaps because it was the referral hospital.

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## **9.5 Cost Recovery**

Cost recovery was highest at the mission hospital, ranging from 20 percent to 211 percent. The rates were relatively similar for delivery and cesarean section services.

The rates at the public hospital are a half to a third of those for the mission hospital. However, since the service volume is low at both the public hospital and public health center, before considering an increase in the rates at the public facilities, the reasons for the low utilization should be determined. For example, it is possible that improvements to the services have been made but not publicized sufficiently to the target population; because people are not aware of the improvements, they are not using the services. In that case, it will be important to conduct a behavior-change communications campaign to inform consumers of the improvements.



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## 10. Recommendations

- ▲ *To improve the allocation of resources, more use of routine maternal health care at lower levels of the health system should be encouraged.*

Since the unit cost of providing routine services is lower in health centers than in hospitals and their service quality is acceptable, clients should be encouraged to use these facilities for these services. Hospital resources can then be reserved for more complicated maternal health services that require more highly skilled, and therefore costly, hospital personnel. One means of increasing the use of health centers is through initiating home visiting (or increasing the visits if they are already taking place) by health personnel in the district.

- ▲ *To decrease unit costs at public facilities, the Ministry of Health should seek ways to reduce the number of maternal health staff at the public hospital and/or encourage increased utilization of maternal health services at public sector facilities.*

Since the number of maternal health staff at the public hospital is too high for the number of services that are provided, unit costs can be lowered by reducing the number of staff providing these services. A second way to reduce unit costs is to increase the utilization of public sector services; unit costs will decrease since indirect costs will be spread among more services.

Before encouraging increased utilization of public facilities, the perceptions of the population toward the services at these facilities should be assessed. If, for example, low utilization is due to lack of awareness about improvements in service delivery at these facilities, then a communications campaign should be conducted. If, on the other hand, utilization is low because clients perceive that user fees are too high for public institutions, making adjustments to or scaling the fee schedule should be considered.

- ▲ *Before increasing user fees, the public sector should assess the population's willingness and ability to pay for maternal health services.*

Since it is not clear whether user fees affected utilization when they were introduced in South Kwahu or whether they would be affected by a future increase in fees, the willingness and ability of clients to pay for maternal health services should be assessed, particularly since utilization is already too low.

- ▲ *One approach that could be considered when evaluating possible cost recovery options is the introduction of financing schemes such as insurance schemes for maternal health care based on actual costs so there can be risk-sharing among clients. The MOH might consider eventually including maternal health services as part of a broader package of services.*

Other studies (e.g. Asenso-Okyere 1997) have shown willingness to pay for health insurance in this district.

- ▲ *Managers should review the time that staff, particularly senior midwives and enrolled midwives, spend on administrative time.*

Since substantial amounts of time are being spent by both senior midwives and enrolled midwives on administrative activities, it is important that their activities be reviewed to determine whether they can be streamlined.

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## **10.1 Additional Research Questions**

- ▲ To understand better why service utilization is low while client satisfaction is high at the public hospital, a survey should be undertaken to assess consumer attitudes and their perceptions of public facilities in South Kwahu.
- ▲ A more thorough assessment of service quality should take place.
- ▲ To have a fuller picture of drug use, assessments of whether drugs are under-, over- or misprescribed should take place.

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## Annex A. Utilization of Services

**Table A1. Maternal Health Statistics (1994-1997)—Utilization of Services in South Kwahu District**

Indicator	1994	1995	1996	1997
Antenatal Care	92.2	81.3*	86	84
Supervised Deliveries	47.8	43.9	42.4	46
Family Planning	24.3	29.2	17.6	7.1
Maternal Mortality Ratio	196/100,000	104/100,000	220/100,000	340/100,000

Source: Mothercare 1998

\*The exclusion of double registration in calculation of antenatal coverage may account for the apparent decrease.



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## Annex B. Bibliography

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